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15ICT0027: ICT IN EDUCATION
A 21st Century skill framework that is appropriate for the South African context.
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#### Declaration

I declare that, to the best of my knowledge and belief, this is my own work, that all sources have been properly acknowledged, and that it contains no plagiarism.

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## **Introduction**

To a larger extent than the century before it, the twenty first century has brought with it a wide array of diverse developments in all the spheres of life. The developments in education, the economy, governments, business, politics, science, technology, health, the environment, workplaces and communities have led to the intensification of the debate about what skills and competencies are needed to prepare citizens for life in the 21st century. A number of theories have been developed and research studies conducted which have made a considerable contribution to the discussions in this debate. According to Metz (2011), the core questions in this debate are about what learners need to learn, value, and be able to do, and whether we are preparing students for the world they will face in the 21st century. The answers to these questions have to a large extent been dependent on how researchers and theorists attempt to define 21st Century Skills.

## **Definition of 21st Century Skills**

The concept ‘21st Century Skills’ refers to the sets of abilities that are relevant to the many aspects of life of these days that people need to develop in order to succeed in the complex world of today. The definition of these abilities is as varied as there are organisations and people attempting to explain them. For example Binkley, Erstad, Herman, Raizen, Ripley & Rumble (2010) define these skills in terms of four categories consisting of ways of thinking, ways of working, tools for working and ways of living in the world. Wagner (2014) on the other hand, refers to them as the seven survival skills made up of critical thinking and problem solving, collaboration across networks and leading by influence, agility and adaptability, initiative and entrepreneurialism, effective oral and written communication, accessing and analysing information and curiosity and imagination. Likewise, Plomp (2013) refers to these skills as lifelong learning skills. Dede (2010), in his article entitled “Comparing Frameworks for 21st Century Skills” agrees that these definitions are diverse and the term ‘21st Century Skills’ is becoming an umbrella phrase under which advocates from various groups can argue for almost any type of knowledge. Therefore, there is no one particular definition of this concept that can claim supremacy over others.

## **The need for 21st Century Skills**

As stated above, the complex world we live in today requires people to have the relevant knowledge, skills and abilities to be able to live a successful life. Bearing this in mind, the question of whether or not, in preparing citizens for the 21<sup>st</sup> century the emphasis should be on content and a broad liberal arts curriculum rather than the teaching of skills such as critical thinking? The main argument against the emphasis on skills is that, although such skills are very important, they cannot be taught independently, and that learners will not be able to apply such skills if they lack the appropriate factual knowledge. On the other hand, the argument for the emphasis on skills is that there is a need for reforms in schools and education to respond to the social and economic needs of students and society in the 21<sup>st</sup> century (Ananiadou & Claro, 2009). According to Resource & Guide (2008), there are three reasons for the need for 21st Century Skills. The first is that the economy is shifting from industrialisation to service orientation driven by information, knowledge and innovation. Secondly, technological development requires workers who are flexible to complex problems, communicate effectively, manage information, work in teams and produce new knowledge. Lastly, there has been an increasing focus on closing achievement gaps between the students' levels of performance, which increases the demand for advanced skills.

## **21<sup>st</sup> Century Skills Frameworks**

The debate about what skills and competencies are needed to prepare citizens for life in the 21<sup>st</sup> century has been topical over the past few decades. Several organizations have made attempts to develop lists of frameworks for 21<sup>st</sup> century skills through literature reviews, surveys, expert panels, and the like. These frameworks have been adopted by governments as guiding principles in the development of their curricula. Depending on the government's goal of education, there are references to the need to educate for new industry, commerce, technology and economic structures; the need for new social interaction and communication skills; the need for imagination, creativity and initiative; the need to learn and continue to learn throughout employment; the need to maintain national and cultural values; and the need to operate in an increasingly international and global environment (Binkley, et.al 2010). Although they are not the only ones, a popular set of frameworks have been developed by the following institutions and organisations:

- The Partnership for 21st Century Skills (P21)
- The Assessing and Teaching of 21st Century Skills (ATC21S)
- enGauge

- International Society for Technology in Education
- Global Achievement Gap

### **The Partnership for 21st Century Skills**

This organisation was founded in 2002 by Ken Kay and Diny Golder-Dardi with support from AOL, Cisco, Microsoft, and the U.S. Department of Education. P21's framework of 21st century skills proposed a set student outcomes, including both core subjects (the 3 R's) and new ones (the 4 C's: critical thinking, communication, collaboration, creativity); information, media, and technology skills; and life and career skills. P21 also proposed that these 21st century student outcomes could affect standards and assessment, curriculum and instruction, professional development, and learning environments (Kyllonen, 2012).

### **The Assessing and Teaching of 21st Century Skills (ATC21S)**

According to Binkley, et al (2010), this organization, sponsored by Cisco, Intel, and Microsoft, developed a framework which was organized as follows into ways of thinking (creativity and innovation; critical thinking, problem solving, and decision making; learning to learn and metacognition), ways of working (communication; collaboration and teamwork), tools for working (information literacy; information technology and communication literacy) and living in the world (life and career; personal and social responsibility)

### **enGauge 21st Century Skills**

The enGauge framework, developed by the Metiri group of consultants, identified four groups of 21st century skills, called the enGauge 21st Century Skills that students will need in order to thrive in a digital economy. It defines four essential 21st century skills which contribute to the success of students. These skills are (i) digital-age literacy (basic, scientific, economic, and technological literacies; visual and information literacies; multicultural literacy and global awareness) (ii) inventive thinking (adaptability, managing complexity, and self-direction; curiosity, creativity, and risk taking; higher-order thinking and sound reasoning) (iii) effective communication (teaming, collaboration, and interpersonal skills; personal, social and civic responsibility; interactive communication) and (iv) high productivity (prioritizing, planning, and managing for results; effective use of real-world tools; ability to produce relevant, high-quality products) (Dede, 2010)

### **International Society for Technology in Education (ISTE)**

The International Society for Technology in Education organisation articulates a more detailed framework for 21<sup>st</sup> century skills than those in the overall P21 framework. The following skills are envisaged: creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts (Dede, 2010).

### **Global Achievement Gap**

This framework was founded by Tony Wagner as a means to bridge the gap between what students are learning and what they will actually need for citizenship in the 21<sup>st</sup> century. It is intended to provide learners with the skills they need to be not only participating and effective 21<sup>st</sup> century citizens, but also life-long learners. This framework proposes that there are seven skills needed for survival in the 21<sup>st</sup> century: critical thinking and problem solving; collaboration across networks and leading by influence; agility and adaptability; initiative and entrepreneurialism; effective oral and written communication; accessing and analysing information; and curiosity and imagination.

### **The proposed 21st Century skills framework for South Africa**

The frameworks discussed above are in no way competing with one another, instead they complement one another. There is no framework that is superior to the others; each framework has an equal role to play in addressing the demands of life in the 21<sup>st</sup> century. Although they have been developed in specific countries, their applicability is not confined to those countries alone; they have universal applicability. As South Africa is part of the global community, it experiences the same 21<sup>st</sup> century skills requirements as other countries experience. However, since it has its own unique circumstances, its requirements will not be exactly the same as that of other nations. In my opinion, any one of the already existing frameworks will be suitable for South Africa but it should be adapted and blended in relation to the contextual factors that prevail in South Africa and that are relevant to the South African context. As Saavedra & Opfer (2012) puts it, to be effective, any curriculum must be relevant to the students' lives. It is for this reason that I recommend that blended teaching consisting of core content subjects and the KSAVE framework will be an appropriate model for South Africa.

The core subjects in my proposed framework will include languages, arts, mathematics, economics, science, geography, history, and life orientation, to mention just a few. The 21<sup>st</sup> century themes will be taken from the KSAVE framework for 21<sup>st</sup> century skills. The KSAVE model is an overall conceptual framework created to structure the analysis of 21<sup>st</sup> century skills. This framework has ten skills grouped into four categories, as follows:

(i) Ways of Thinking

- Creativity and innovation
- Critical thinking, problem solving, decision making
- Learning to learn, metacognition

(ii) Ways of Working

- Communication
- Collaboration (teamwork)

(iii) Tools for Working

- Information literacy (includes research on sources, evidence, biases, etc.)
- ICT literacy, and

(iv) Living in the World

- Citizenship – local and global
- Life and career
- Personal & social responsibility – including cultural awareness and competence

(Binkley, et.al 2010).

The South African school curriculum is dominated by traditional academic subjects and, as such, does not provide learners with sufficient skills to participate effectively in their local as well as the global environment. Despite their mastery of the content after graduation, most of the graduates from educational institutions are unable to apply their knowledge to solve contemporary problems. This results in an increasing number of people with qualifications but without employment or even self-employment opportunities. We are always experiencing a continually increasing rate of unemployment in this country because of this. It also shows that, as stated in Literacy (2014), it is the mastery of both core subjects and 21<sup>st</sup> century themes that is essential to student success. Therefore, for us to successfully prepare learners for effective 21<sup>st</sup> century citizenship, we need to implement an educational framework that incorporates both core content subjects and 21<sup>st</sup> century skills.

The likelihood for success in implementing the framework proposed above in South Africa lies in part on our modification of our perception of the school, the teacher, the learner and the curriculum, and in addressing a number of challenges of accommodating the 21<sup>st</sup> century skills in the curriculum. In order to structure our education system to meet the needs of students of the 21st century, we need to redefine what we mean by school, teacher, learner and curriculum so that we can better understand where we are and where we want to go. Shaw (2009) provides us with the way forward when she suggests that schools should change from being just buildings to being nerve centres that connect teachers, students and the community to the wealth of knowledge that exists in the world; teachers have to convert from their primary role as dispensers of information to facilitators of learning and help students turn information into knowledge, and knowledge into wisdom; and learners should no longer be viewed as young people who go to school, spend time in certain courses, pass and graduate but as knowledge generators and not just information recipients. Furthermore, the curriculum has to change from being irrelevant and meaningless to being relevant, integrated, interdisciplinary and inclusive (Shaw, 2009).

The above ideals are impossible without a vehicle that will ensure their realisation. This vehicle, in my view, is an intensive integration of information and communications technologies (ICT's) into the South African education system. ICT integration involves the use technology to enhance and support learning, teaching and management in schools. Cloud (2010) agrees that this is the gateway for teaching students the skills they need to be successful in the 21st century and for making authentic teaching and learning environments both inside and outside the classroom. There are various strategies that can be used for ICT integration and acceleration. The NMC Horizon Report of 2015 on Higher Education Edition highlights a number of strategies that will have an impact on education, such as the use of online learning, varying learning spaces, open educational resources, data-driven learning and assessment, digital literacy, blending formal and informal learning, promoting complex thinking and communication, integrating personalized learning, new models of education, bring your own device (BYOD), flipping the classroom, makerspaces, wearable technology, adaptive learning technologies and the internet of things.

Coming to addressing the challenges in accommodating the 21<sup>st</sup> century skills in our curriculum, we need first to understand what they exactly are in order to deal effectively with them. According to Plomp (2013) there are four main obstacles in the process of teaching and



acquiring 21st century skills, which include content versus skills, teacher quality, access to technology and assessment. The content versus skills challenge is the concern about the overemphasis on skills acquisition at the expense of content knowledge in the teaching of 21st century skills. There is an absence of balance between the teaching and learning of skills and that of subject knowledge in the schooling system. The teacher quality challenge is the issue of teachers being overburdened with administrative and school work load, which decreases their competence in subject matter and the use of technology in the classroom. The technology access challenge is about the shortage of suitable technologies caused by the schools with limited resources having to choose between purchasing textbooks, teaching aids and equipment, or purchasing the most suitable computers, mobile devices and internet access. Lastly, there is a dilemma on what should be assessed in 21<sup>st</sup> century teaching and learning. There is a division between those who feel that assessing skills independent of content knowledge is ideal and those who are for assessing richer learning and more complex tasks (Plomp, 2013). That is why there is so much lack of uniformity and standardisation in assessment processes and results in South Africa.

Having noted and understood the prevailing perceptions that impact on the framework I have proposed, and the challenges facing the integration of 21<sup>st</sup> century skills into our curriculum, the next logical step is to outline the measures that can be taken to minimise the challenges in order to ensure the successful implementation of the proposed framework, which is my next topic of discussion.

### **Implementing the proposed 21<sup>st</sup> century skills framework**

The lecture method of transmitting factual knowledge in group learning spaces through lectures and textbooks, which is still the dominant approach in the South African public school system, is not the most effective way to teach 21st century skills. The preparation of the type of person envisaged for the 21<sup>st</sup> century responsible citizenship requires innovation and creativeness. This is the reason why I think that the task of implementing my proposed 21st century skills framework will require the collective effort of teachers, administrators and policymakers. Since it will involve the entire education system, time, support and resources will be an absolute necessity in increasing teacher and administrator capacity through training, professional development and career mobility. This macro approach to curriculum implementation can be complemented with micro approaches that can be put in place in the classroom. Saavedra and Opfer (2012) suggest nine lessons that inform how to teach 21<sup>st</sup>

century skills in the classroom, which are: make learning relevant, teach through the disciplines, develop lower and higher order thinking skills at the same time, encourage transfer of learning, teach students to learn to learn (metacognition), address misunderstandings directly, promote teamwork as a process and outcome, exploit technology to support learning and foster students' creativity (Saavedra & Opfer, 2012).

### **Conclusion**

In conclusion, I wish to reiterate that there is no one curriculum framework that is suitable for all countries. The selection of a suitable 21<sup>st</sup> century skills framework for South Africa depends on the contextual factors that prevail in South Africa. For the successful implementation of 21st century skills, teachers, policy makers and administrators have to change their mind set and be exposed to technological applications in education. It will not be an easy ride, there will be some challenges that have to be addressed, but 21<sup>st</sup> century skills have to be incorporated into the aims and goal of education in South Africa so that our education becomes relevant in the information society. The integration of ICT's into education will go a long way towards the realisation of this dream.

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